

```
cmdStopConvert.Enabled = 1
cmdStopConvert.Visible = 1
```

```
Parameters:
BoardNum: the number used by CB.CFG to describe this board
LowChan: first A/D channel of the scan
HighChan: last A/D channel of the scan
CBCounts: the total number of A/D samples to collect
CBRate: Sample rate in samples per second
Gain: the gain for the board
FileName: the filename for the collected data values
Options: data collection options
```

```
CBCounts = 10000
FileName = "data" 'a full path may be required here
Close
BoardNum = 1
LowChan = 0
HighChan = 1023
CBRate = 1000000
Gain = 1
FileName = "data"
Options = 0
```

```
Dim WithEvents DataCount As Integer
Dim WithEvents LowChan As Integer
Dim WithEvents HighChan As Integer
Dim WithEvents Options As Integer
Dim WithEvents Gain As Integer
Dim WithEvents FileName As String
Dim WithEvents CBCount As Integer
Dim WithEvents PreTrig As Integer
```

```
Private Sub DataCount_ValueChanged()
DataCount = DataCount + 1
End Sub
Private Sub LowChan_ValueChanged()
LowChan = LowChan + 1
End Sub
Private Sub HighChan_ValueChanged()
HighChan = HighChan + 1
End Sub
Private Sub Options_ValueChanged()
Options = Options + 1
End Sub
Private Sub Gain_ValueChanged()
Gain = Gain + 1
End Sub
Private Sub FileName_TextChanged()
FileName = FileName
End Sub
Private Sub CBCount_ValueChanged()
CBCount = CBCount + 1
End Sub
Private Sub PreTrig_ValueChanged()
PreTrig = PreTrig + 1
End Sub
```

```
Private Sub btnCollect_Click()
Collect the values
ULStats = cbFileGetInfo(FileName, LowChan, HighChan, CBCount, CBRate, Gain, Options)
If ULStats < 0 Then
MsgBox "Error: The name of the file you created does not exist."
cmdStopConvert.Visible = 0
cmdStartConvert.Visible = 1
End If
DataCount = 0
LowChan = 0
HighChan = 0
Options = 0
Gain = 0
FileName = ""
CBCount = 0
PreTrig = 0
```

```
Private Sub btnRead_Click()
Read the values
ULStats = cbFileGetInfo(FileName, LowChan, HighChan, CBCount, CBRate, Gain, Options)
If ULStats < 0 Then
MsgBox "Error: The name of the file you created does not exist."
cmdStopConvert.Visible = 0
cmdStartConvert.Visible = 1
End If
DataCount = 0
LowChan = 0
HighChan = 0
Options = 0
Gain = 0
FileName = ""
CBCount = 0
PreTrig = 0
```

```
Private Sub btnStop_Click()
cmdStopConvert.Visible = 1
cmdStartConvert.Visible = 0
End Sub
```

```
Private Sub btnStart_Click()
cmdStopConvert.Visible = 0
cmdStartConvert.Visible = 1
End Sub
```

```
Private Sub btnConvert_Click()
cmdStopConvert.Visible = 0
cmdStartConvert.Visible = 1
End Sub
```

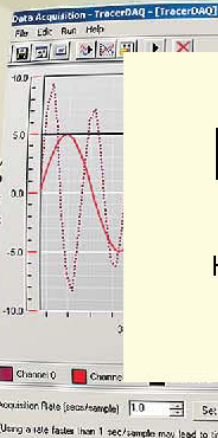
```
Private Sub btnRead_Click()
Read the values
ULStats = cbFileGetInfo(FileName, LowChan, HighChan, CBCount, CBRate, Gain, Options)
If ULStats < 0 Then
MsgBox "Error: The name of the file you created does not exist."
cmdStopConvert.Visible = 0
cmdStartConvert.Visible = 1
End If
DataCount = 0
LowChan = 0
HighChan = 0
Options = 0
Gain = 0
FileName = ""
CBCount = 0
PreTrig = 0
```

```
End Sub
Private Sub cmdStopConvert_Click()
End
End Sub
```

# User's Guide

## PCI-QUAD-AC5

High Output Digital I/O Board



# PCI-QUAD-AC5

## High Output Digital I/O Board

### User's Guide



**MEASUREMENT  
COMPUTING™**

Document Revision 2, July, 2005

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# About this User's Guide

## What you will learn from this user's guide

This user's guide explains how to install, configure, and use the PCI-QUAD-AC5 board so that you get the most out of its digital I/O features.

This user's guide also refers you to related documents available on our web site, and to technical support resources.

## Conventions in this user's guide

The following conventions are used in this manual to convey special information:

**For more information on ...**

Text presented in a box signifies additional information and helpful hints related to the subject matter you are reading.

**Caution!** Shaded caution statements present information to help you avoid injuring yourself and others, damaging your hardware, or losing your data.

<#.#> Angle brackets that enclose numbers separated by a colon signify a range of numbers, such those assigned to registers, bit settings, etc.

**bold text** **Bold** text is used for the names of objects on the screen, such as buttons, text boxes, and check boxes. For example:  
1. Insert the disk or CD and click the **OK** button.

*italic text* *Italic* text is used for the names of manuals and help topic titles, and to emphasize a word or phrase. For example:  
▪ The *InstaCal* installation procedure is explained in the *Quick Start Guide*.  
▪ *Never* touch the exposed pins or circuit connections on the board.

## Where to find more information

The following electronic documents provide helpful information relevant to the operation of the PCI-QUAD-AC5.

- MCC's *Specifications: PCI-QUAD-AC5* (the PDF version of Chapter 6 in this guide) is available on our web site at [www.mccdaq.com/pdfs/PCI-QUAD-AC5.pdf](http://www.mccdaq.com/pdfs/PCI-QUAD-AC5.pdf).
- MCC's *Register Map for the PCI-QUAD-AC5 Series* is available on our web site at [www.mccdaq.com/registermaps/RegMapPCI-QUAD-AC5.pdf](http://www.mccdaq.com/registermaps/RegMapPCI-QUAD-AC5.pdf)
- MCC's *Quick Start Guide* is available on our web site at [www.mccdaq.com/PDFmanuals/DAQ-Software-Quick-Start.pdf](http://www.mccdaq.com/PDFmanuals/DAQ-Software-Quick-Start.pdf).
- MCC's *Guide to Signal Connections* is available on our web site at [www.mccdaq.com/signals/signals.pdf](http://www.mccdaq.com/signals/signals.pdf).
- MCC's *Universal Library User's Guide* is available on our web site at [www.mccdaq.com/PDFmanuals/sm-ul-user-guide.pdf](http://www.mccdaq.com/PDFmanuals/sm-ul-user-guide.pdf).
- MCC's *Universal Library Function Reference* is available on our web site at [www.mccdaq.com/PDFmanuals/sm-ul-functions.pdf](http://www.mccdaq.com/PDFmanuals/sm-ul-functions.pdf).
- MCC's *Universal Library for LabVIEW™ User's Guide* is available on our web site at [www.mccdaq.com/PDFmanuals/SM-UL-LabVIEW.pdf](http://www.mccdaq.com/PDFmanuals/SM-UL-LabVIEW.pdf).

This user's manual is also available on our web site at [www.mccdaq.com/PDFmanuals/PCI-QUAD-AC5.pdf](http://www.mccdaq.com/PDFmanuals/PCI-QUAD-AC5.pdf).

# Introducing the PCI-QUAD-AC5

## Overview: PCI-QUAD-AC5 features

The PCI-QUAD-AC5 is a 96-bit, high output, digital I/O board for PCI-compatible computers. Primarily designed as a direct interface to the industry-standard SSR-PB24 rack, the board is also highly useful as a general purpose digital I/O board.

The 96-bits of digital I/O are organized into four 24-bit groups based on an 82C55 mode 0 emulation (no strobed I/O or bi-directional I/O bits). Each 24-bit group is divided into three eight-bit ports labeled PORTA, PORTB and PORTC. PORTC can be split into two four-bit nibbles — Port C-HI and Port C-LO. Each of these ports may be individually programmed as input or output.

All inputs and outputs are TTL compatible. The digital output drivers are 74S244 chips that can sink 64 mA and source 15 mA. The input buffers are 74LS373 chips and have standard high input impedance of the 74LS series devices. All I/O is brought out to a 50-pin connectors, which also allows connection to the PC's +5 Volt and Ground.

On power up and reset, all I/O bits are set to input mode. If you are using the board to control items that must be OFF on reset, install pull-down resistors. Each board is equipped with open locations where you can install SIP resistor networks for either pull-up or pull-down.

The PCI-QUAD-AC5 board is completely plug-and-play, with no jumpers or switches to set. All board addresses and interrupt sources are set by the board's plug-and-play software. Board configuration is controlled by your system's BIOS.

## Software features

The following software ships with the PCI-QUAD-AC5 free of charge.

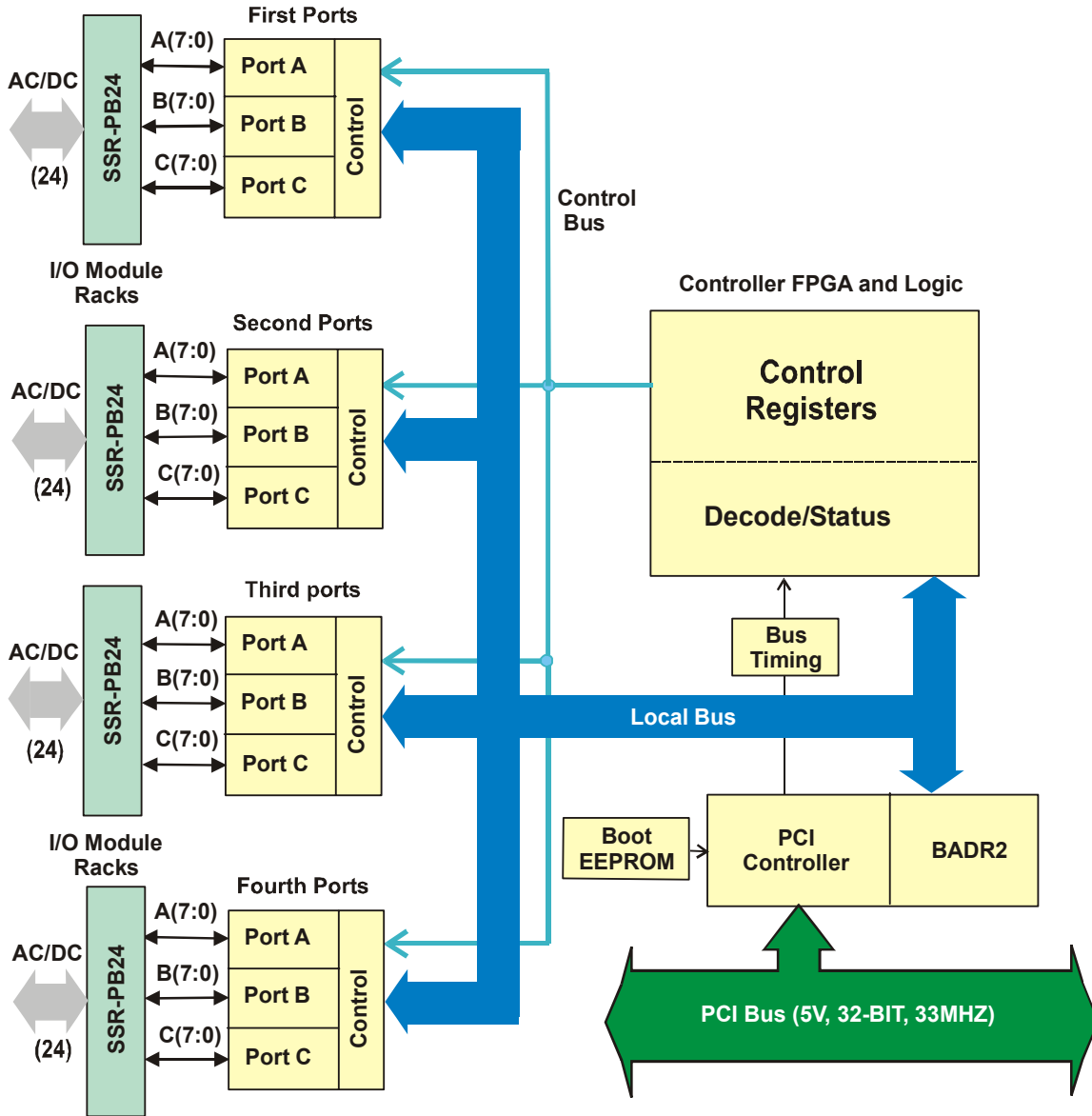
- *InstaCal* installation, calibration, and test utility
- TracerDAQ™ suite of virtual instruments
- SoftWIRE® for Visual Studio® .NET graphical programming
- MCC DAQ Components for VS .NET (installed with SoftWIRE® for VS .NET)

For information on the features of *InstaCal*, *TracerDAQ*, and *SoftWIRE*, refer to the *Quick Start Guide* booklet that shipped with the PCI-QUAD-AC5.



## Block Diagram

PCI-QUAD-AC5 functions are illustrated in the block diagram shown here.



# Installing the PCI-QUAD-AC5

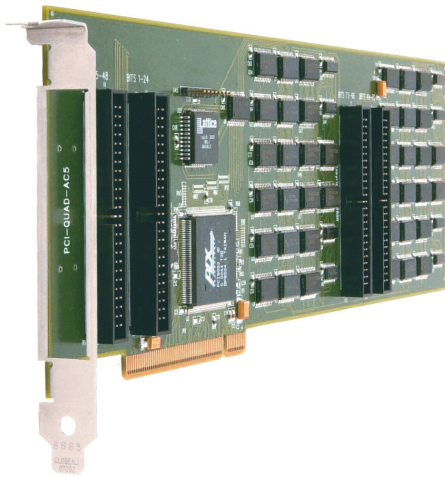
## What comes with your PCI-QUAD-AC5 shipment?

As you unpack your board, make sure each of the items shown below is included:

### Standard components

The following items should be included with your shipment:

- PCI-QUAD-AC5 board



### Software

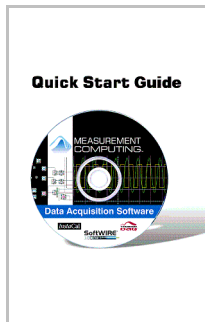
The *Measurement Computing Data Acquisition Software* CD contains the following software:

- *InstaCal* installation, calibration, and test utility
- TracerDAQ suite of virtual instruments
- SoftWIRE for VS .NET
- SoftWIRE MCC DAQ Components for .NET



### Documentation

In addition to this hardware user's guide, you should also receive the *Quick Start Guide* (available in PDF at [www.mccdaq.com/PDFmanuals/DAQ-Software-Quick-Start.pdf](http://www.mccdaq.com/PDFmanuals/DAQ-Software-Quick-Start.pdf)). Please read this booklet completely before installing any software and hardware.



## Optional components

You can also order the following MCC products to use with your PCI-QUAD-AC5.

### Cables



C50FE-x



C50FF-x

### Signal termination and conditioning accessories

MCC provides signal conditioning and termination products for use with the PCI-QUAD-AC5. Refer to [Field wiring and signal termination](#) on page 2-6 for a complete list of compatible accessory products.

If any items are missing or damaged, notify Measurement Computing Corp. immediately by phone, fax, or e-mail:

- Phone: 508-946-5100 and follow the instructions for reaching Tech Support.
- Fax: 508-946-9500 to the attention of Tech Support
- Email: [techsupport@measurementcomputing.com](mailto:techsupport@measurementcomputing.com)

## Unpacking the board

The PCI-QUAD-AC5 board is shipped in an antistatic container to prevent damage by an electrostatic discharge. To avoid such damage, perform the following procedure when unpacking and handling your board.

1. Before opening the antistatic container, ground yourself with a wrist-grounding strap or by holding onto a grounded object (such as the computer chassis).
2. Touch the antistatic container to the computer chassis before removing the board from the container.
3. Remove the board from the container. *Never* touch the exposed pins or circuit connections on the board.

If your board is damaged, notify Measurement Computing Corporation immediately by phone, fax, or e-mail. For international customers, contact your local distributor where you purchased the board.

- Phone: 508-946-5100 and follow the instructions for reaching Tech Support.
- Fax: 508-946-9500 to the attention of Tech Support
- Email: [techsupport@measurementcomputing.com](mailto:techsupport@measurementcomputing.com)

## Installing the software

Install the software included with your board *before* you install the hardware. Installing the software first ensures that the information required for proper board detection is installed and available at boot up.

Refer to the *Quick Start Guide* for instructions on installing the software on the *Measurement Computing Data Acquisition Software CD*. This booklet is shipped with the hardware, and is also available in PDF at [www.mccdaq.com/PDFmanuals/DAQ-Software-Quick-Start.pdf](http://www.mccdaq.com/PDFmanuals/DAQ-Software-Quick-Start.pdf).

## Installing the hardware

The PCI-QUAD-AC5 board is completely plug-and-play. There are no switches or jumpers to set on the board. Configuration is controlled by your system's BIOS. To install your board, follow the steps below.

### **Install the MCC DAQ software before you install your board**

The driver needed to run your board is installed with the MCC DAQ software. Therefore, you need to install this software before you install your board. Follow the directions for installing this software in the *Quick Start Guide* that shipped with your board.

1. Turn your computer off, open it up, and insert your board into an available PCI slot.
2. Close your computer and turn it on.

If you are using an operating system with support for plug-and-play (such as Windows 2000 or Windows XP), a dialog box pops up as the system loads indicating that new hardware has been detected. If the information file for this board is not already loaded onto your PC, you will be prompted for the disk containing this file. The MCC DAQ software contains this file. If required, insert the *Measurement Computing Data Acquisition Software CD* and click **OK**.

3. To test your installation and configure your board, run the *InstaCal* utility installed in the previous section. Refer to the *Quick Start Guide* that came with your board for information on how to initially set up and load *InstaCal*.

## Connecting the board for I/O operations

### Connectors, cables – main I/O connector

Table 2-1 lists the board connectors, applicable cables, and compatible accessory products for the PCI-QUAD-AC5.

Table 2-1. Board connector, cables, and accessory equipment

Connector type	Four, male 50-pin 0.1" spaced double row connectors
Compatible cables	C50FE-x cable C50FF-x cable
Compatible accessory products (with the C50FE-x cable)	SSR-PB24 (up to 4, one cable required per PB24 board)
Compatible accessory products (with the C50FF-x cable)	CIO-MINI50 (four) CIO-SPADE50 (four) CIO-TERM100 (two) SCB-50 (two)

The PCI-QUAD-AC5 has four 50-pin header connectors (P1 to P4). If you are connecting to SSR-PB24 racks or equivalent, we recommend using the C50FE-x series cable (see Figure 2-2).

If you need direct access to the digital I/O, use the C50FF-x series cable to connect four CIO-MINI50 boards, four CIO-SPADE50, two SCB-50 boards, or two CIO-TERM100 terminal accessory boards. Any of these bring all I/O connections out to convenient, easy-to-use screw terminals.

When installing the ribbon cables, thread them through the bracket on the end of the board.

#### Information on signal connections

General information regarding signal connection and configuration is available in the *Guide to Signal Connections* (available at [www.mccdaq.com/signals/signals.pdf](http://www.mccdaq.com/signals/signals.pdf)).

### Pinout – main I/O connectors

The pin out for the four I/O connectors is listed in Figure 2-1.

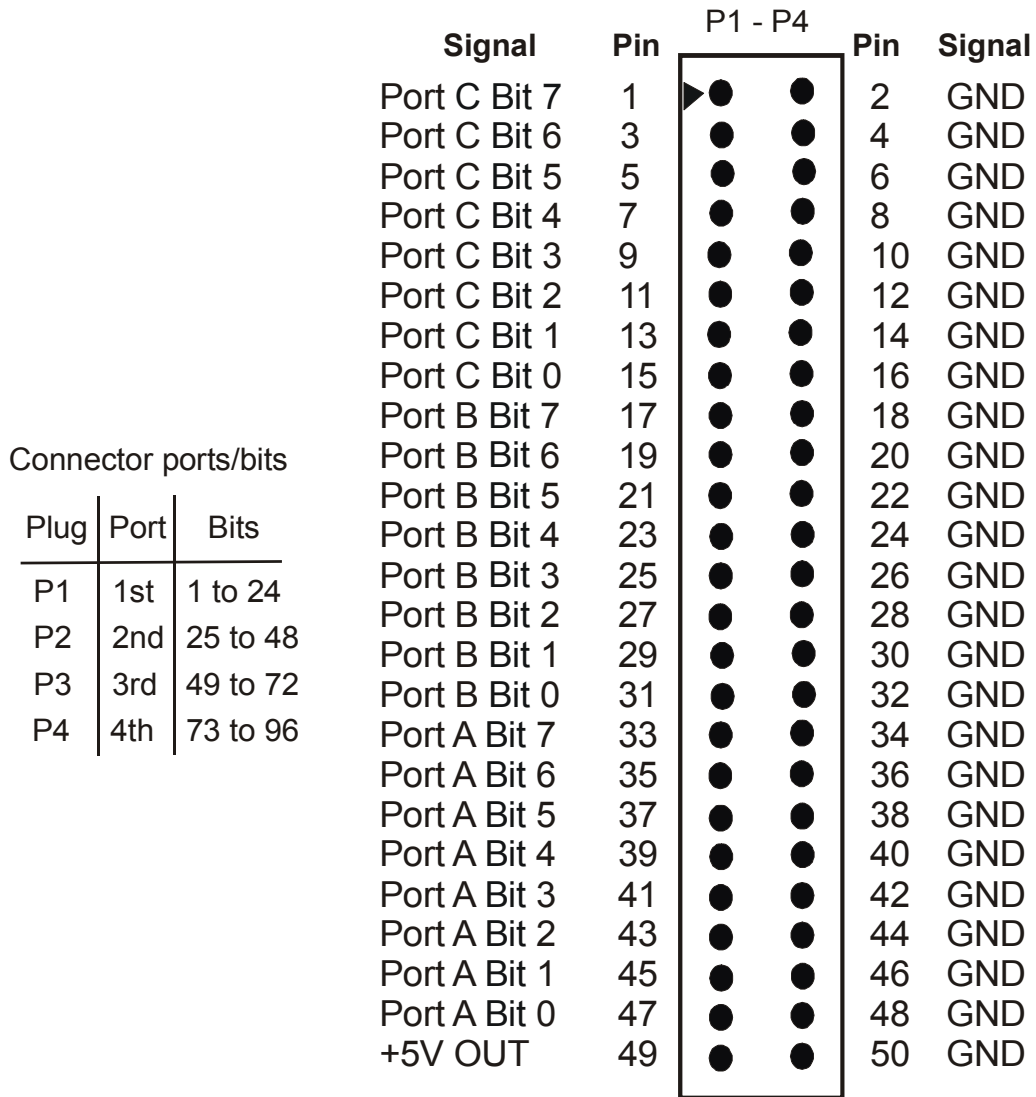


Figure 2-1. I/O connector pin-out

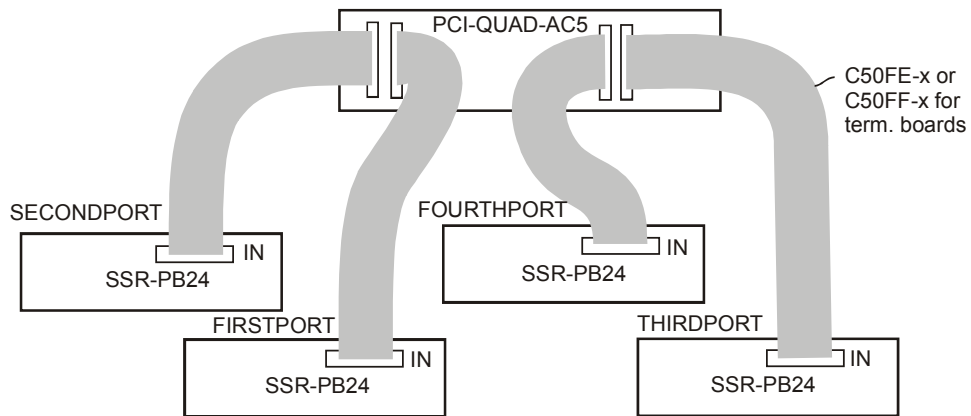


Figure 2-2. PCI-QUAD-AC5 to SSR-PB24 relay racks

## Field wiring and signal termination

You can use the following screw terminal boards to terminate field signals and route them into the PCI-QUAD-AC5 using the C50FF-x cable.

- CIO-MINI50 – 50-pin universal screw terminal board. Four boards are required. Details on this product are available on our web site at [www.mccdaq.com/cbicatalog/cbiproduct.asp?dept\\_id=102&pf\\_id=258](http://www.mccdaq.com/cbicatalog/cbiproduct.asp?dept_id=102&pf_id=258).
- CIO-SPADE50 — 16" x 4" termination panel which mates with both 37-pin and 50-pin connectors. Four boards are required. Details on this product are available on our web site at [www.mccdaq.com/pdfs/screw.pdf](http://www.mccdaq.com/pdfs/screw.pdf).
- CIO-TERM100 – 100-pin screw terminal board (daisy-chained 50-pin IDC connectors). Two boards are required. Details on this product are available on our web site at [www.mccdaq.com/cbicatalog/cbiproduct.asp?dept\\_id=102&pf\\_id=281](http://www.mccdaq.com/cbicatalog/cbiproduct.asp?dept_id=102&pf_id=281).
- SCB-50 – 50 conductor, shielded signal connection/screw terminal box provides two independent 50-pin connections. Two boards are required. Details on this product are available on our web site at [www.mccdaq.com/cbicatalog/cbiproduct.asp?dept\\_id=196&pf\\_id=1168](http://www.mccdaq.com/cbicatalog/cbiproduct.asp?dept_id=196&pf_id=1168).

You can use the following relay mounting rack with the C50FE-x cable to provide digital signal conditioning.

- SSR-PB24 – 24 channel solid-state relay mounting and interface rack. Details on this product are available on our web site at [www.mccdaq.com/cbicatalog/cbiproduct.asp?dept\\_id=122&pf\\_id=619](http://www.mccdaq.com/cbicatalog/cbiproduct.asp?dept_id=122&pf_id=619). The PCI-QUAD-AC5 supports up to four SSR-PB24 boards (one cable required per SSR-PB24).

---

# Programming and Developing Applications

After following the installation instructions in Chapter 2, your board should now be installed and ready for use. In general there may be no correspondence among registers for different boards. Software written at the register level for other models will not function correctly with your board.

## Programming languages

Measurement Computing's Universal Library® provides access to board functions from a variety of Windows programming languages. If you are planning to write programs, or would like to run the example programs for Visual Basic® or any other language, please refer to the *Universal Library User's Guide* (available on our web site at <http://www.mccdaq.com/PDFmanuals/sm-ul-user-guide.pdf>).

## Packaged applications programs

Many packaged application programs, such as SoftWIRE®, Labtech Notebook™, and HP-VEE™, now have drivers for your board. If the package you own does not have drivers for the board, please fax or e-mail the package name and the revision number from the install disks. We will research the package for you and advise how to obtain drivers.

Some application drivers are included with the Universal Library package, but not with the application package. If you have purchased an application package directly from the software vendor, you may need to purchase our Universal Library and drivers. Please contact us by phone, fax or e-mail:

- Phone: 508-946-5100 and follow the instructions for reaching Tech Support.
- Fax: 508-946-9500 to the attention of Tech Support
- Email: [techsupport@measurementcomputing.com](mailto:techsupport@measurementcomputing.com)

## Register-level programming

You should use the Universal Library or one of the packaged application programs mentioned above to control your board. Only experienced programmers should try register-level programming.

If you need to program at the register level in your application, refer to the *Register Map for the PCI-QUAD-AC5*. This document is available on our website at [www.mccdaq.com/registermaps/RegMapPCI-QUAD-AC5.pdf](http://www.mccdaq.com/registermaps/RegMapPCI-QUAD-AC5.pdf).



## Functional Details

### Signal connections

All digital inputs and outputs on the PCI-QUAD-AC5 connector are TTL and are fully compatible with the inputs and outputs on the industry-standard PB-24 rack (Measurement Computing Corporation's model SSR-PB24).

### 82C55 emulation

The PCI-QUAD-AC5 board emulates the 82C55 chip. The 82C55 emulation initializes all ports as inputs on power-up and reset. A TTL input is a high impedance input. If you connect another TTL input device to the output, it could be turned *on* or *off* every time the board is reset.

To establish a consistent TTL level at power-up, use resistors tied to either +5V (pull-up) or ground (pull-down). There are open locations for pull-up and pull-down resistor SIPs on the board.

When an 82C55 emulation is powered on or reset, all pins are set to high-impedance input. Based on standard TTL functionality, these inputs will typically float high, and may have enough drive current to turn on external devices.

Consequently, if you have output devices such as solid state relays, they may be switched on whenever the computer is powered on or reset. To prevent unwanted switching, and to drive all outputs to a known state after power on or reset, pull all pins either high or low through a 2.2 K ohm resistor.

### Pull-up and pull-down resistors

TTL inputs typically float high, but not reliably. The direction they float is dependent on the characteristics of the circuit and is unpredictable. If devices such as solid state relays are driven by digital I/O pins, they can be switched on whenever the computer is powered on or is reset. To prevent unwanted switching at power-on or reset, force all digital I/O pins to a known state by pulling all pins either high or low through a 2.2 K ohm resistor tied to either 5V or GND.

The pull-up resistor pulls the input to a high state (+5V) when the board is in input mode, as it would be on power-up or reset. A 2.2 K ohm resistor draws only 2 mA. A grounded 2.2 K ohm pull-down resistor pulls the I/O line low when the board is in input mode.

The SIP is made up of eight 2.2 K ohm resistors. One side of each resistor is connected to a single common point and brought out to a pin. The common line is marked with a dot or line at one end of the SIP. The remaining resistor ends are brought out to the other eight pins (refer to Figure 4-3).

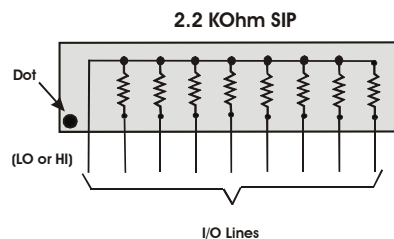


Figure 4-3. Eight-Resistor SIP Schematic

The PCI-QUAD-AC5 board has open locations where you can install a 2.2 K ohm, eight-resistor single inline package (SIP) resistor network for each port. Each of the four port locations is identified by the bit range — the First Port connector (P1) is labeled **Bits 1 to 24**, the Second Port connector (P2) is labeled **Bits 25 to 48**, the Third Port connector (P3) is labeled **Bits 49 to 72**, and the Fourth Port connector (P4) is labeled **Bits 73 to 96**. Pull-up/pull-down SIP locations (3 per port) are labeled **A, B** and **C**, and are adjacent to each port. Refer to Figure 4-4.

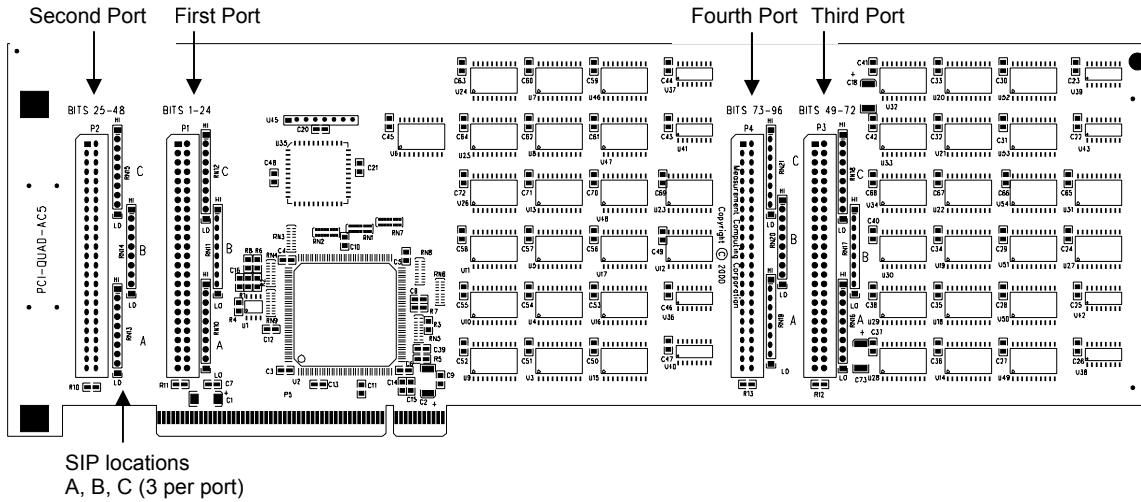


Figure 4-4. PCI-QUAD-AC5 layout and SIP locations

When installed, the SIP establishes either a high or low logic level at each of the eight I/O lines on the port. At each board location, A, B, and C, there are 10 holes in a line. The hole on one end is marked "HI" and is connected to +5V. The other end is marked "LO" and is connected to GND. The eight holes in the middle connect to the eight lines of the port, A, B or C.

To pull-up lines, orient the SIP with the common pin (dot) toward the HI end; to pull-down, install the resistor with the common pin in the LO end.

Figure 4-5 shows a schematic of an SIP installed in both the pull-up and pull-down positions.

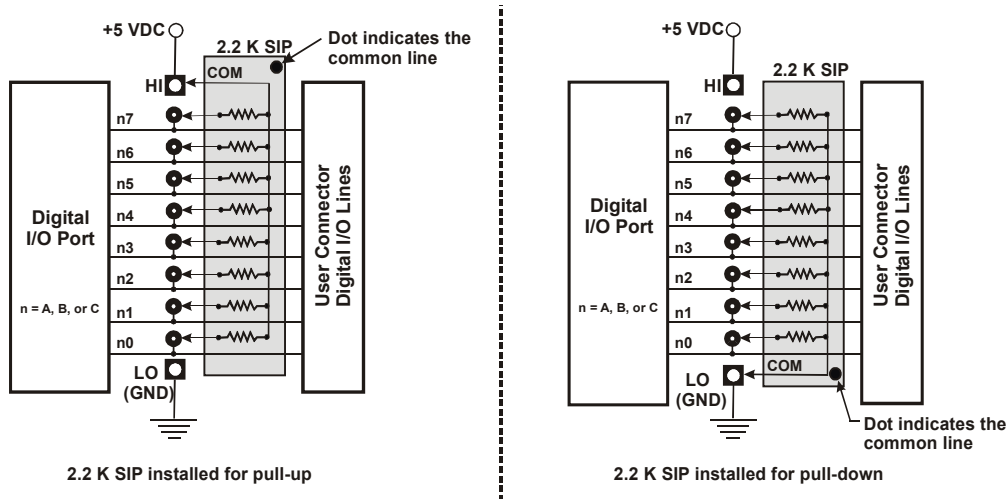


Figure 4-5. Pull-up and pull-down resistor SIP schematic

We recommend using 2.2KΩ SIPs (MCC part number SP-K2.29C). Use a different value only if necessary.

**Unconnected inputs float**

Unconnected inputs typically float high, but not reliably. If you are using a PCI-QUAD-AC5 board for input and have unconnected inputs, ignore the data from those lines. You do not have to terminate input lines, and unconnected lines will not affect the performance of connected lines. Ensure that you mask out any unconnected bits in software.

**TTL to solid state relays**

Many applications require digital outputs to switch AC and DC voltage motors on and off or to monitor AC and high DC voltages. These AC and high DC voltages cannot be controlled or read directly by the TTL digital lines of a PCI-QUAD-AC5.

Solid State Relays (SSRs) allow control and monitoring of AC and high DC voltages and provide 750 V isolation. SSRs are the recommended method of interfacing to AC and high DC signals.

The most convenient way to use solid state relays and a PCI-QUAD-AC5 board is to purchase a Solid State Relay Rack. The rack recommended for use with the PCI-QUAD-AC5 board is the SSR-PB24 from Measurement Computing Corporation.

## Specifications

Typical for 25 °C unless otherwise specified.

Specifications in *italic text* are guaranteed by design.

### Power consumption

+5V	2.4 A typical, 3.6 A max
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### Digital input / output

Digital type	Digital Outputs - 74S244 Digital Inputs - 74LS373
Number of I/O	96
Configuration per 82C55A Mode 0 emulation	<ul style="list-style-type: none"> <li>▪ 2 banks of 8 bits and 2 banks of 4</li> <li>▪ Each bank programmable as either input or output</li> </ul>
<i>Input low voltage</i>	<i>0.8 V max.</i>
<i>Input high voltage</i>	<i>2.0 V min.</i>
<i>Output low voltage</i>	<i>0.5 V max. (I<sub>ol</sub> = 64 mA)</i>
<i>Output high voltage</i>	<i>2.4 V min. (I<sub>oh</sub> = -15 mA)</i>
<i>High level output current</i>	<i>-15 mA max.</i>
<i>Low level output current</i>	<i>64 mA max.</i>
<i>Absolute maximum input voltage</i>	<i>7.0 V max.</i>
Pull-up/pull-down resistors	Locations provided for user installation of pull-up or pull-down resistors.
Power on / reset	High impedance

### Environmental

<i>Operating temperature range</i>	<i>0 to 70 °C</i>
<i>Storage temperature range</i>	<i>-40 to 70 °C</i>
<i>Humidity</i>	<i>0 to 95% non-condensing</i>

### Mechanical

Card dimensions	PCI long card: 312 mm long x 107 mm high x 18.5 mm thick
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### Main connector and pin out

Connector type	Four, male 50-pin 0.1" spaced double row connectors
Compatible cables	C50FE-x cable C50FF-x cable
Compatible accessory products (with the C50FE-x cable)	SSR-PB24 (up to 4, one cable required per PB24 board)
Compatible accessory products (with the C50FF-x cable)	CIO-MINI50 (four) CIO-SPADE50 (four) CIO-TERM100 (two) SCB-50 (two)

**P1**

Pin	Signal Name	Pin	Signal Name
1	FIRST PORT C Bit 7	2	GND
3	FIRST PORT C Bit 6	4	GND
5	FIRST PORT C Bit 5	6	GND
7	FIRST PORT C Bit 4	8	GND
9	FIRST PORT C Bit 3	10	GND
11	FIRST PORT C Bit 2	12	GND
13	FIRST PORT C Bit 1	14	GND
15	FIRST PORT C Bit 0	16	GND
17	FIRST PORT B Bit 7	18	GND
19	FIRST PORT B Bit 6	20	GND
21	FIRST PORT B Bit 5	22	GND
23	FIRST PORT B Bit 4	24	GND
25	FIRST PORT B Bit 3	26	GND
27	FIRST PORT B Bit 2	28	GND
29	FIRST PORT B Bit 1	20	GND
31	FIRST PORT B Bit 0	32	GND
33	FIRST PORT A Bit 7	34	GND
35	FIRST PORT A Bit 6	36	GND
37	FIRST PORT A Bit 5	38	GND
39	FIRST PORT A Bit 4	40	GND
41	FIRST PORT A Bit 3	42	GND
43	FIRST PORT A Bit 2	44	GND
45	FIRST PORT A Bit 1	46	GND
47	FIRST PORT A Bit 0	48	GND
49	+5V Out	50	GND

**P2**

Pin	Signal Name	Pin	Signal Name
1	SECOND PORT C Bit 7	2	GND
3	SECOND PORT C Bit 6	4	GND
5	SECOND PORT C Bit 5	6	GND
7	SECOND PORT C Bit 4	8	GND
9	SECOND PORT C Bit 3	10	GND
11	SECOND PORT C Bit 2	12	GND
13	SECOND PORT C Bit 1	14	GND
15	SECOND PORT C Bit 0	16	GND
17	SECOND PORT B Bit 7	18	GND
19	SECOND PORT B Bit 6	20	GND
21	SECOND PORT B Bit 5	22	GND
23	SECOND PORT B Bit 4	24	GND
25	SECOND PORT B Bit 3	26	GND
27	SECOND PORT B Bit 2	28	GND
29	SECOND PORT B Bit 1	20	GND
31	SECOND PORT B Bit 0	32	GND
33	SECOND PORT A Bit 7	34	GND
35	SECOND PORT A Bit 6	36	GND
37	SECOND PORT A Bit 5	38	GND
39	SECOND PORT A Bit 4	40	GND
41	SECOND PORT A Bit 3	42	GND
43	SECOND PORT A Bit 2	44	GND
45	SECOND PORT A Bit 1	46	GND
47	SECOND PORT A Bit 0	48	GND
49	+5V Out	50	GND

**P3**

Pin	Signal Name	Pin	Signal Name
1	THIRD PORT C Bit 7	2	GND
3	THIRD PORT C Bit 6	4	GND
5	THIRD PORT C Bit 5	6	GND
7	THIRD PORT C Bit 4	8	GND
9	THIRD PORT C Bit 3	10	GND
11	THIRD PORT C Bit 2	12	GND
13	THIRD PORT C Bit 1	14	GND
15	THIRD PORT C Bit 0	16	GND
17	THIRD PORT B Bit 7	18	GND
19	THIRD PORT B Bit 6	20	GND
21	THIRD PORT B Bit 5	22	GND
23	THIRD PORT B Bit 4	24	GND
25	THIRD PORT B Bit 3	26	GND
27	THIRD PORT B Bit 2	28	GND
29	THIRD PORT B Bit 1	20	GND
31	THIRD PORT B Bit 0	32	GND
33	THIRD PORT A Bit 7	34	GND
35	THIRD PORT A Bit 6	36	GND
37	THIRD PORT A Bit 5	38	GND
39	THIRD PORT A Bit 4	40	GND
41	THIRD PORT A Bit 3	42	GND
43	THIRD PORT A Bit 2	44	GND
45	THIRD PORT A Bit 1	46	GND
47	THIRD PORT A Bit 0	48	GND
49	+5V Out	50	GND

**P4**

Pin	Signal Name	Pin	Signal Name
1	FOURTH PORT C Bit 7	2	GND
3	FOURTH PORT C Bit 6	4	GND
5	FOURTH PORT C Bit 5	6	GND
7	FOURTH PORT C Bit 4	8	GND
9	FOURTH PORT C Bit 3	10	GND
11	FOURTH PORT C Bit 2	12	GND
13	FOURTH PORT C Bit 1	14	GND
15	FOURTH PORT C Bit 0	16	GND
17	FOURTH PORT B Bit 7	18	GND
19	FOURTH PORT B Bit 6	20	GND
21	FOURTH PORT B Bit 5	22	GND
23	FOURTH PORT B Bit 4	24	GND
25	FOURTH PORT B Bit 3	26	GND
27	FOURTH PORT B Bit 2	28	GND
29	FOURTH PORT B Bit 1	20	GND
31	FOURTH PORT B Bit 0	32	GND
33	FOURTH PORT A Bit 7	34	GND
35	FOURTH PORT A Bit 6	36	GND
37	FOURTH PORT A Bit 5	38	GND
39	FOURTH PORT A Bit 4	40	GND
41	FOURTH PORT A Bit 3	42	GND
43	FOURTH PORT A Bit 2	44	GND
45	FOURTH PORT A Bit 1	46	GND
47	FOURTH PORT A Bit 0	48	GND
49	+5V Out	50	GND

## EC Declaration of Conformity

We, Measurement Computing Corporation, declare under sole responsibility that the product

PCI-QUAD-AC5

96-bit, high drive digital I/O board with AC5 and PB24 interface

*Part Number*

*Description*

to which this declaration relates, meets the essential requirements, is in conformity with, and CE marking has been applied according to the relevant EC Directives listed below using the relevant section of the following EC standards and other informative documents:

- EU EMC Directive 89/336/EEC: Essential requirements relating to electromagnetic compatibility.
- EN 55022 Class B (1995): Radiated and conducted emission requirements for information technology equipment.
- EN50082-1 (1997): EC generic immunity requirements.
- EN 61000-4-2 (1995): Electrostatic discharge immunity.
- EN 61000-4-3 (1997) ENV 50204 (1996): RF immunity.
- EN 61000-4-4 (1995): Electric fast transient burst immunity.

Carl Haapaoja, Vice-President of Design Verification

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